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ABSTRACT

Employer-sponsored, job-related training as a means of satisfying labor demands has potentially profound implications for the operation of the nation's economic system. The alternatives of bidding for desired workers and downgrading job requirements tend to increase inflation and lessen productivity. Since the end of the 1960's, the ability of employers to attract and retain workers at a given point in the business cycle has declined substantially. This apparently sharp increase in labor market imbalance (a worsening match between the skills possessed by labor force members and the skills required in jobs) has not been met by an increase in the per employee amount of employer-sponsored (nominally paid for) job-related training. There is strong evidence that employers have turned to wage bidding to attract needed employees. Employers' decisions concerning low investment in formal training have been guided by profit maximization. While this may be good private decision making, it may lead to undesirable social outcomes--inflation and lower productivity. (Twelve tables are found in the body of the paper and in an appendix.) (YLB)

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THE IMPORTANCE OF EMPLOYER-SPONSORED JOB-RELATED TRAINING*

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Employers confronting unsatisfied labor demands can bid for desired workers, lower their standards for employment, or offer more training to certain employees. Which response firms choose will affect their profitability; it will also condition society's inflation and productivity growth records. That is, while bidding for desired workers and downgrading job requirements might produce more profits than investments in training, these practices will most likely impose a cost on society in terms of inflationary pressure and deteriorating productivity growth. Hence, an analysis of the importance of employer-sponsored job-related training has potentially profound implications for the operation of our economic system.

This paper begins by arguing that the ability of employers to attract and retain workers at a given point in the business cycle has declined substantially since the end of the 1960's. It then provides evidence which indicates that this apparent sharp increase in labor market imbalance was not met by an increase in the per employee amount of employer-sponsored (i.e., nominally paid for) job-related training. The study concludes by briefly discussing the main implications of and reasons for the recent history of investment in formal training.

The Apparent Sharp Growth in Labor Market Imbalance

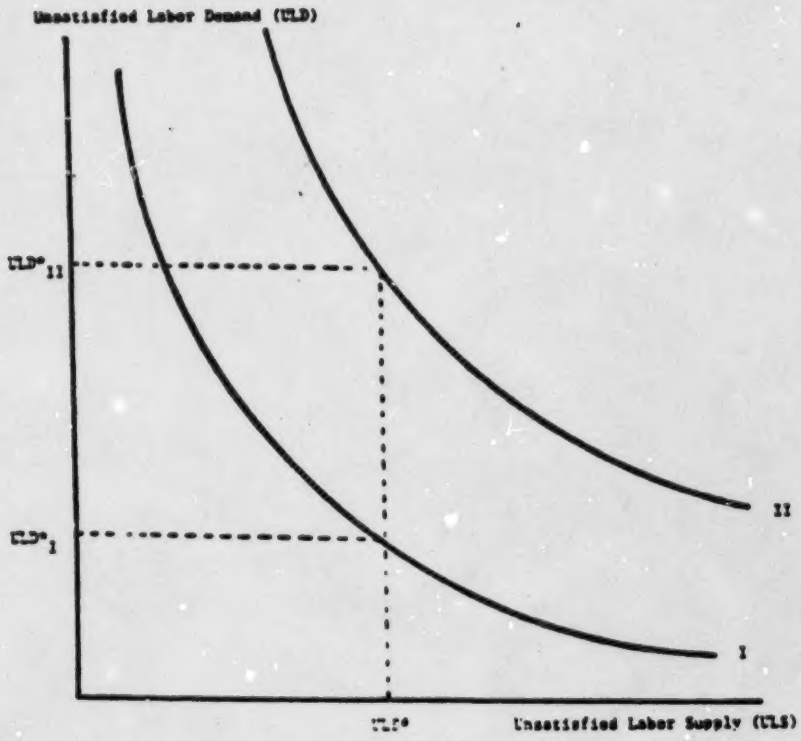
The evidence concerning changes in labor market imbalance can be summarized with "imbalance curves," which link a measure of employers' ability to attract and retain workers to a measure of labor market tightness. An imbalance curve can be expected to portray a negative relationship between

firms' unsatisfied labor demand and unutilized labor supply, which implies that employers' ability to meet their labor needs is, all else the same, least during booms and greatest during slumps. If the imbalance curve for one period lies outside the imbalance curve for an earlier period (as in Figure 1, in which curve II lies outside curve I), it can be said that labor market imbalance has increased; employers in the latter period find it more difficult, for a given unutilized labor supply (for example, ULS* in Figure 1), to fill job openings and keep them filled than at the same point in the earlier period (hence $ULD^*_{II} > ULD^*_{I}$). In this fashion, the concept of "growing labor market imbalance" is implicitly defined.

An obvious candidate for measuring employers' inability to meet their labor demands would be a job vacancy rate. However, despite some flirtation with the idea in the late 1960's, our country's statistical agencies have not produced economy-wide job vacancy rates on a continuing basis. For this reason, imbalance analyses must turn to other measures. One candidate is the "normalized" help wanted index, which is constructed by dividing an index of lines of help wanted advertising in a panel of U.S. newspapers (provided by the Conference Board) by the number of employees on non-agricultural payrolls. Another ULD surrogate comes from unpublished discharges (i.e., fires) rates generated for the manufacturing sector until recently by the Bureau of Labor Statistics' (BLS's) Labor Turnover Survey.

Until the demographic events of the past decade, unutilized labor supply (ULS) was usually measured by the official rate of unemployment. However, with the influx of teenagers and women into the labor force, many came to believe that labor supply conditions could be more accurately gauged with the

Figure 1. Imbalance Curves in Two Periods



unemployment rate for prime-age males, or with some rate which was constructed in a way which corrected for the changes in the composition of the labor force.[1]

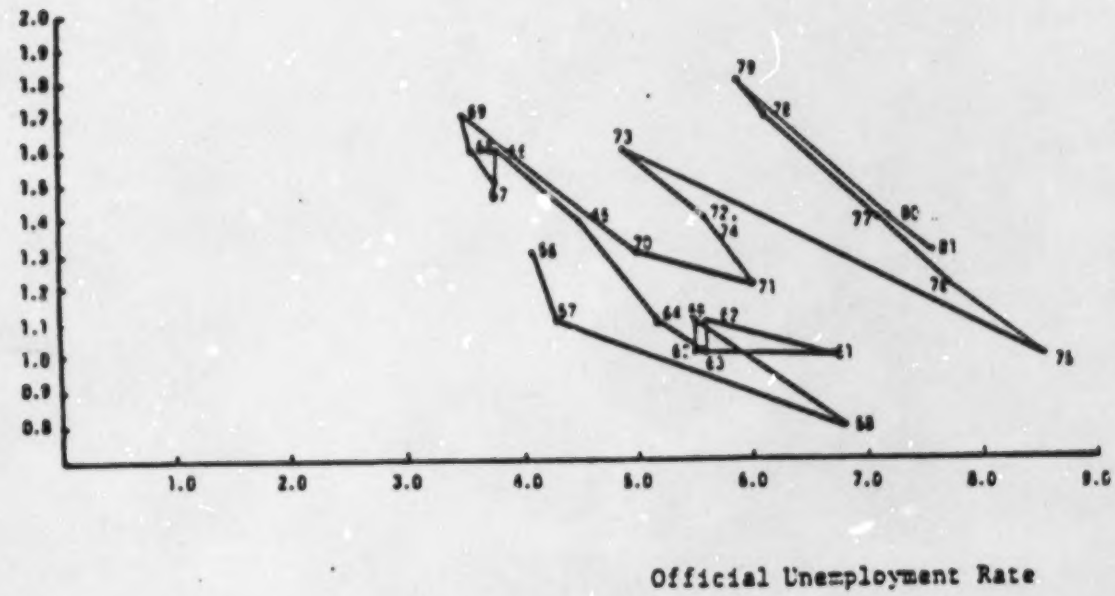
Figures 2 and 3 show imbalance curves relating normalized help wanted index values and discharge rates to both the official and prime-age male rates of unemployment. The figures in these tables strongly suggest a dramatic increase in labor market imbalance since 1969, with outward shifts in imbalance curves occurring in both 1969 and 1973.

Figures 2A and 2B present plots relating the normalized help wanted index to the official and prime-age male rates of unemployment. In both plots, the points from 1958 through 1969 seem to lie more or less along a single curve; both plots exhibit a dramatic shift outward in 1970. In addition, they shift sharply outward again after 1974, which is likely to reflect to some extent the fact that the volume of help wanted advertising may have increased during the middle and late 1970's because of increased affirmative action pressures.[2] It should be noted that when the prime age male unemployment rate is used instead of the official unemployment rate, the shifts in the imbalance plots are somewhat less pronounced, but nevertheless remain substantial.

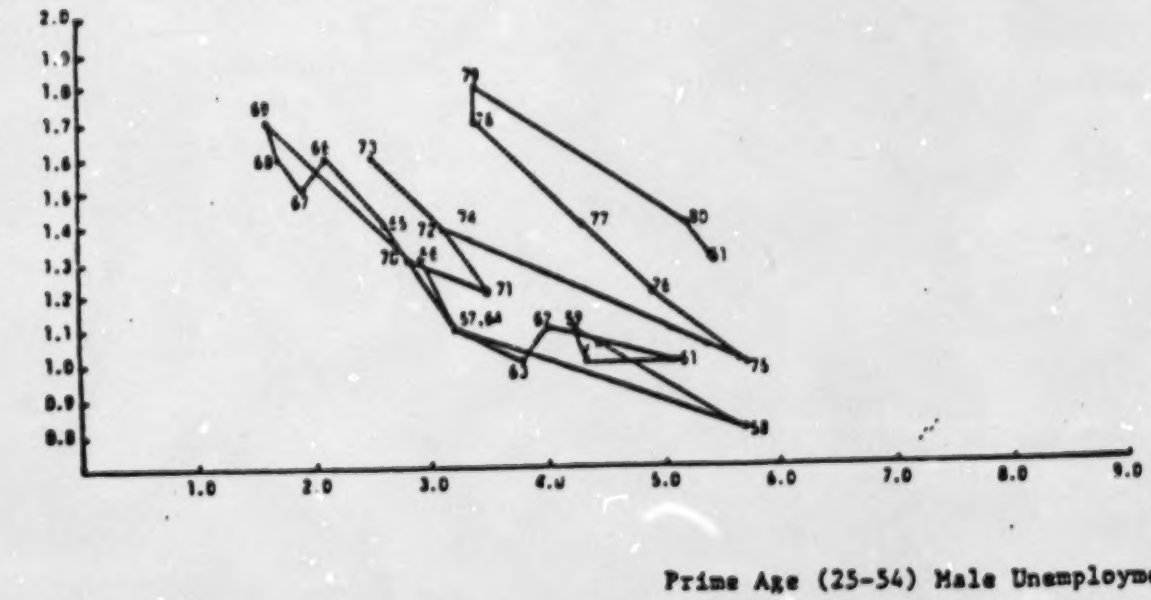
Figures 3A and 3B examine manufacturing firms' discharge rates at various points in time, where discharges are defined as "terminations of employment initiated by the employer for such reasons as incompetence, violation of rules, dishonesty, laziness, absenteeism, insubordination, failure to pass probationary period, etc."[3] The plots in 3A and 3B imply that, since 1969, employers have found it substantially more difficult to find employees that can meet performance standards.

Figure 2: Labor Market Imbalances as Reflected in the Relationship between the Normalized Help Wanted Index and Two Unemployment Rates[a,b]

2A. Normalized Help Wanted Index vs. Official Unemployment Rate



2B. Normalized Help Wanted Index vs. Prime Age (25-54) Male Unemployment Rate

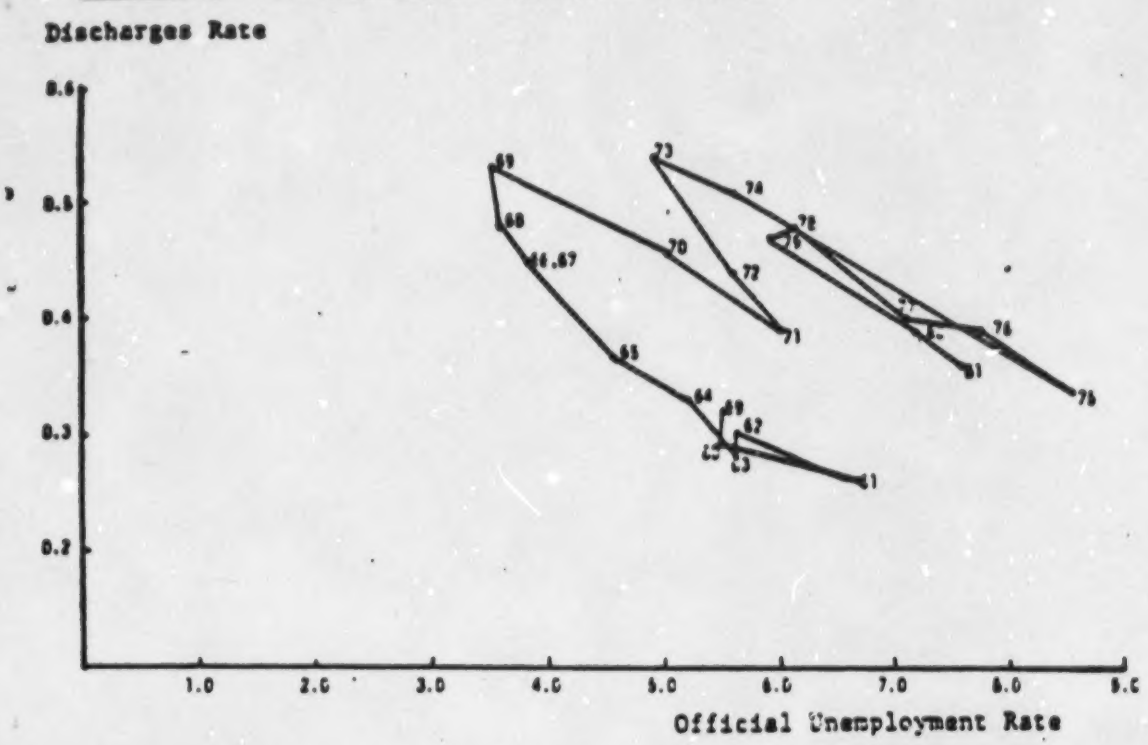


a. Both the official unemployment rate variable and the prime age male unemployment rate variable are an annual average of seasonally adjusted monthly rates.

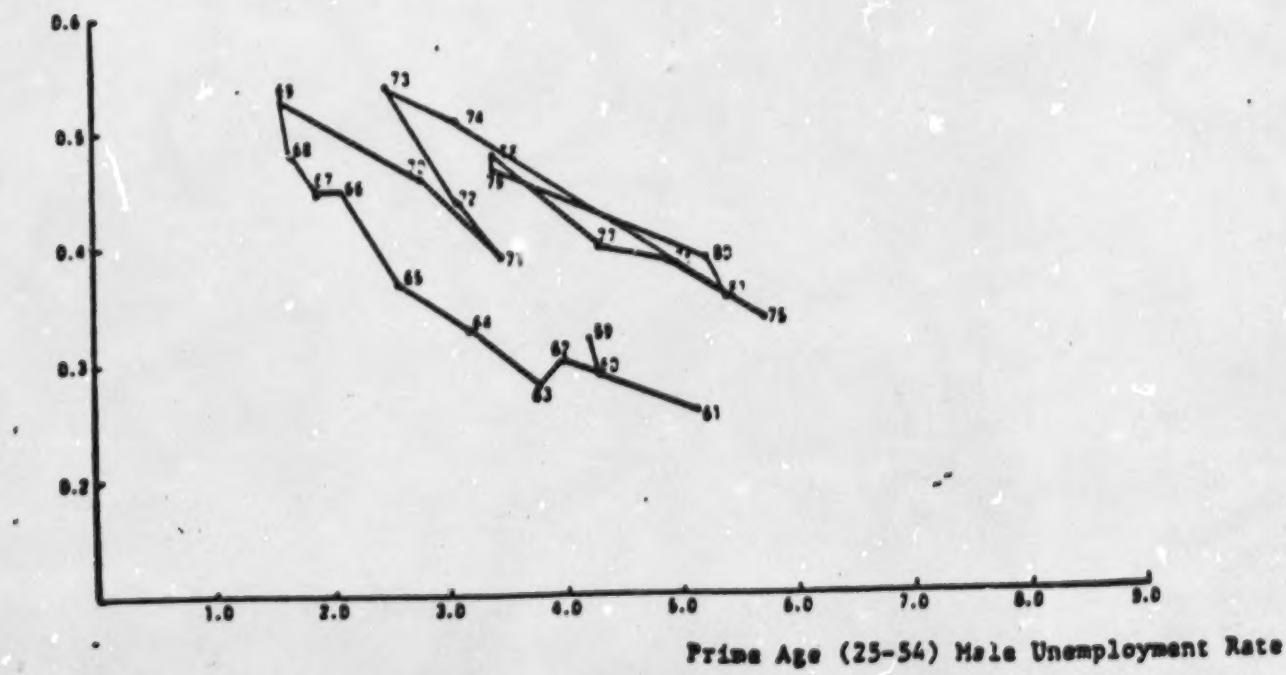
b. The normalized help wanted index was constructed by taking the average of the monthly seasonally adjusted help wanted index figures for each year and dividing by employees on nonagricultural payrolls.

Figure 3. Labor Market Imbalance as Reflected in the Relationship between the Manufacturin Discharges Rate and Two Unemployment Rates[a,b]

3A. Discharges Rate vs. Official Unemployment Rate



3B. Discharges Rate vs. Prime Age (25-54) Male Unemployment Rate



a. Both the official unemployment rate variable and the prime age male unemployment rate variable are an annual average of seasonally adjusted monthly rates.

b. The discharge rate variable is an annual average of seasonally adjusted monthly data for the manufacturing sector.

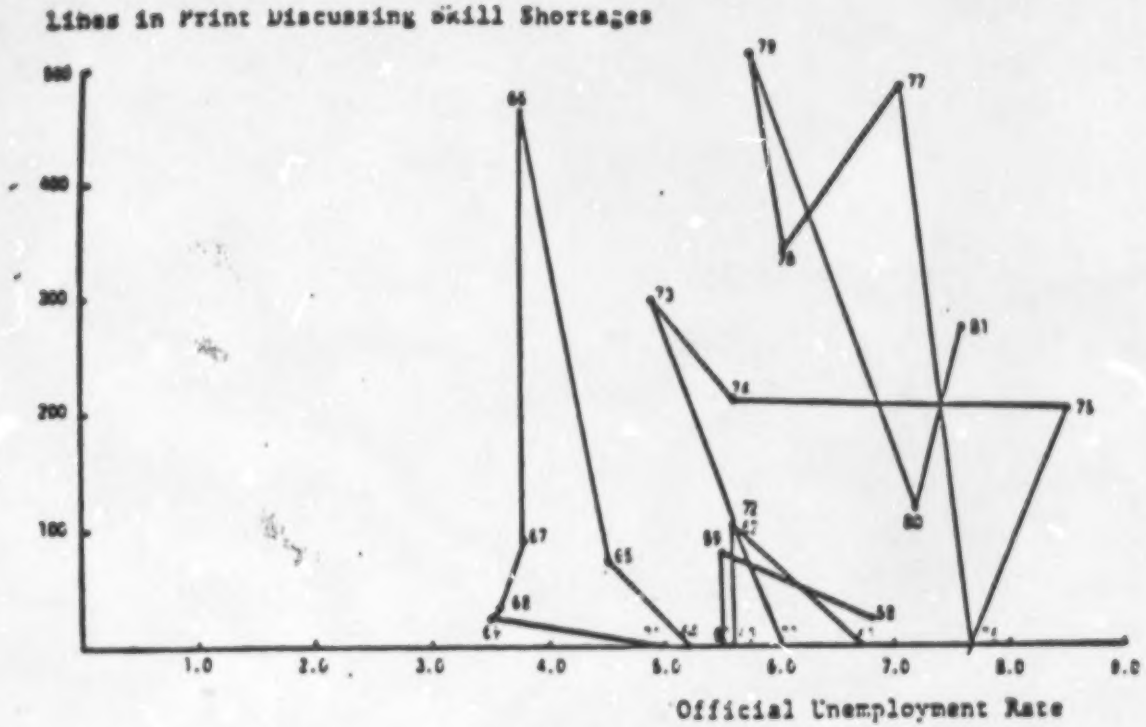
Outward shifting imbalance curves do not necessarily document growing skill shortages. The growing imbalance may reflect a number of other supply- and demand-related factors such as more liberalized unemployment insurance benefits or a reduced work ethic on the part of the unemployed. To provide some evidence on the role of skill shortages in the growing imbalance, the lines in print mentioning skill shortages in a panel of 71 periodicals was counted for each year between 1958 and 1981. These line counts are plotted against the official and prime-age male unemployment rates in Figures 4A and 4B. The two plots indicate that the amount of attention given to skill shortages in the business press, at a given rate of unutilized labor supply, has in fact grown substantially since 1969. Thus, we conclude that a significant fraction of the recent growth in labor market imbalance has to do with a worsening match between the skills possessed by labor force members and the skills required in jobs. This conclusion is also very consistent with the discussion found in the periodicals which were scrutinized for our line counts.[4]

The Nature of the Formal Training Response

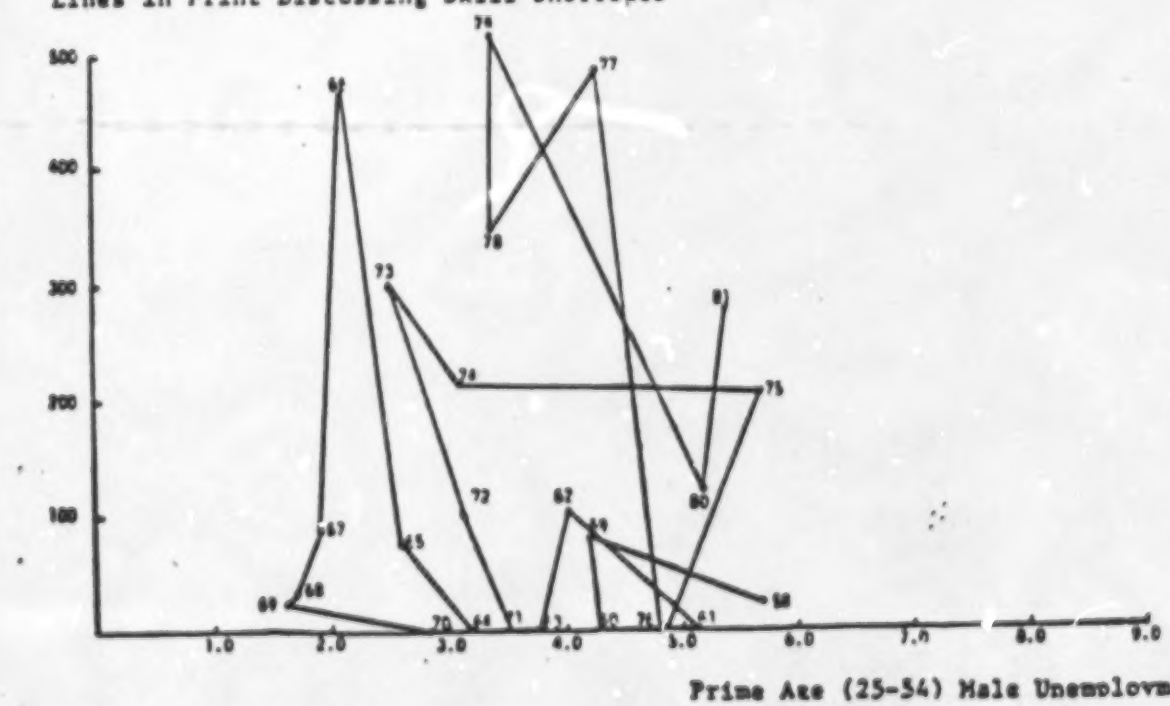
To what extent have employers responded to increased staffing difficulties by increasing their formal training effort? This question can be addressed with data from the Survey of Adult Education (SAE), conducted by the Bureau of the Census as part of the May Current Population Surveys (CPS) in 1969, 1972, 1975, 1978, and 1981 (the 1981 data are not yet available). In each CPS interview, questions were asked to determine whether an individual had taken part in some type of organized adult education during the past 12

Figure 4. Skill Shortage as Reflected in the Relationship between Lines in Print Discussing Skill Shortages, and Two Unemployment Rates[a,b]

4A. Lines in Print Discussing Skill Shortages vs. Official Unemployment Rate



4B. Lines in Print Discussing Skill Shortages vs. Prime Age (25-54) Male Unemployment Rate



a. Both the official unemployment rate variable and the prime age male unemployment rate variable are an annual average of seasonally adjusted monthly rates.

b. The lines in print discussing skill shortage variable was constructed by counting the lines discussing skill shortages found in a panel of 71 periodicals.

months; if so, the SAE questionnaire was left to be filled out and returned by mail. Space was left for the respondent to give his or her own descriptions of up to twenty (twenty-three in 1978) courses. In 1969, 1972 and 1975, full-time students under the age of 35 did not receive SAE questionnaires; for consistency, we excluded this group from the 1978 SAE sample.

The first variable constructed with the SAE was the percentage of various groups of employees who received employer-sponsored (where "sponsored" means "were reported to have paid for") job-related training (ESJRT). The determination as to whether or not a course was employer-sponsored was made with the following questions:

12. Who paid for this course or activity? *(Mark all that apply)*	1. Self or family	1. ☐
	2. Employer	2. ☐
	3. Other *(Describe)*	3. ☐ _____
	4. Don't know	4. ☐ *Describe*

in 1969;

12. Who paid for this course or activity? *(Mark all that apply)*	1. Self or family	1 ☐
	2. Employer	2 ☐
	3. Public funding	3 ☐
	4. Private organization (church, professional association)	4 ☐
	5. Other *(Describe)*	5 ☐
	6. Don't know	6 ☐ _____ *Describe*

in 1972 and 1975. In each of these cases, whenever the respondent marked "Employer" we took this to indicate that the training was employer-sponsored. In 1978 the question changed, so that "Employer" no longer appeared as a response to the "Who paid for...?" question; instead, if the employer was one

of the sources of training, the respondent checked "Yes" for the question, "Is your employer one of the sources...?":

10a. Who paid for this course or activity? (MARK (X) ALL THAT APPLY)	1. Self or family ..... How much did you and your family pay for tuition and required fees?	(016) 1☐ (017) $ _____ .00 (Dollars only)
	2. Public funding (Federal, State, county or local government agency, including public schools)	(018) 2☐
	3. Business or industry	* 3☐
	4. Private organization (such as, church, professional association, YMCA, or Red Cross)	4☐
	5. Other (Describe)	5☐ _____ (Describe)
	6. Don't know	6☐
10b. Is your employer one of the sources of payment marked in 10a?	1. Yes	(019) 1☐
	2. No	2☐

Hence in 1978 we took a "Yes" response to question 10b to indicate that the training was employer-sponsored.

With the 1969, 1972 and 1975 microdata, the assessment as to whether training was "job related" was based on the following query:

3. Why did you take this course or activity? (Mark the main reason)	1. For general information	1☐
	2. To improve or advance in job	2☐
	3. To get a new job	3☐
	What kind? (Be as specific as possible)	_____
	4. For community activity	4☐
	5. For personal or family interests	5☐
	6. For social or recreational reasons	6☐
	7. Other (Describe)	7☐ _____ Describe

The second and third responses were taken as indicating that training was "job related." In 1978, the questionnaire contained more detail about the purpose of training:

6. Why did you take this course or activity? (MARK (X) THE MAIN REASON)	1. To improve, advance, or keep up-to-date in my current job	(007) 1 ☐
	2. To get a new job in my current occupation or in an occupation I have worked in previously	2 ☐
	3. To get a job in a new occupational field	3 ☐
	4. Other job-related reason (Describe)	4 ☐ _____ (Describe)
	5. To prepare for naturalization as an American citizen	5 ☐
	6. For general education	6 ☐
	7. For personal or social reasons (such as, community activity, home and family life, personal development, social and recreational interests)	7 ☐
	8. Other non-job-related reason (Describe)	8 ☐ _____ (Describe)

Here, each of the first four responses was taken as an indicator that training was job-related.

Separate training participation rates were derived for training taken anywhere and for training taken at work. The questions on which this distinction was based were:

5. Where did this course, class or activity USUALLY take place? (Mark one)	1. School or college building	1. ☐
	2. Community center	2. ☐
	3. Church	3. ☐
	4. Place of work	4. ☐
	5. Private home	5. ☐
	6. Other (Describe)	6. ☐ _____ Describe

in 1969;

5. Where did this course, class or activity USUALLY take place? (Mark one)	1. School building	1 ☐
	2. College or university building	2 ☐
	3. Community Center	3 ☐
	4. Church, or other religious property	4 ☐
	5. Place of work	5 ☐
	6. Private home	6 ☐
	7. Hotel or other public commercial building	7 ☐
	8. Other (Describe)	8 ☐ _____ Describe

in 1972 and 1975; and

14. Was this course or activity USUALLY given at your place of work?	1 ☐ Yes ..... 2 ☐ No	(025) 1 ☐ Yes 2 ☐ No

in 1978.

Each SAE questionnaire has at its front a letter from the Director of the Bureau of the Census stating what adult education is. The cover letters on the 1969, 1972 and 1975 surveys differ in their language, but with the following question, each of the surveys adopts the same implicit definition:

2. Which one of these general categories best describes this course or activity? *(Mark only one)*	1. Adult basic education (reading, arithmetic)	1. ☐
	2. Americanization	2. ☐
	3. High school and college courses for credit	3. ☐
	4. Technical and vocational skills	4. ☐
	5. Managerial skills	5. ☐
	6. Professional skills	6. ☐
	7. Civic and public affairs	7. ☐
	8. Religion	8. ☐
	9. Safety	9. ☐
	10. Home and family living	10. ☐
	11. Personal development	11. ☐
	12. Hobbies and handicrafts	12. ☐
	13. Sports and recreation	13. ☐
	14. Other *(Describe)*	14. ☐ *Describe* _____

It seems clear that the questionnaires were supposed to be focusing on formal (as opposed to on-the-job) training courses which "have a teacher or instructor" (1975 Survey of Adult Education, p. 1). For this reason, the 1969, 1972, and 1975 Surveys seem to implicitly exclude most training under an apprenticeship or internship program; the 1978 questionnaire does this explicitly when it states that "courses or educational activities in an apprenticeship or internship program" are "not to be reported" (1978 Survey of Adult Education, p. 8).

In sum, it appears that while there are questionnaire changes from one SAE to the next, they are very unlikely to have significant effects on the trend in ESJRT percentages. Hence, with confidence in our ability to analyze trends in training participation rates, we turn to the SAE estimates.

Table 1 presents the ESJRT percentages for courses taken anywhere.[5] When the table's "total" figures are plotted against the prime-age male unemployment rate, we see a very slight shift outward in the percentage of employees receiving formal employer-sponsored job-related training taken anywhere. If we choose two roughly comparable (in terms, at least, of the prime-age male rate of unemployment) years for comparison, "SAE year"[6] 1972 (when the rate was 3.8) and "SAE year" 1978 (when it was 4.0), we find that the training rate rose, but only by 5 percent.[7]

It is interesting to note that three of the four groups in which training percentages grew the most between 1972 and 1978 -- women, employees in services, and employees in the South -- were the groups in which the percentage of workers with few years of job experience is likely to have grown the most during the 1970's[8]; it would be expected that those with lower-than-average job tenure should be prime candidates for formal training. The sharp increase in training percentages for those 50 and over may reflect legislation which served to raise the mandatory retirement age from 65 to 70, or it may indicate that employers are doing more retraining of workers whose proven reliability outweighs the shorter return-on-investment period they represent.[9]

Table 2 gives the percentages of employees in the same groupings as in Table 1 who are receiving ESJRT at work.[10] The "Total" row in the table indicates that there was no at-work ESJRT response to the apparent sharp

Table 1. Participation in Employer-Sponsored Job-Related Training, Taken Anywhere, Not by Correspondence, Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a]
(percentage of total population in category receiving this type of training)

Item	Year			
	1969	1972	1975	1978
Total	3.6	3.8	3.7	4.0
Sex				
Male	4.6	4.5	4.2	4.2
Female	1.9	2.6	3.1	3.8
Race				
White	3.9	4.1	3.9	4.3
Nonwhite	1.3	1.5	2.2	1.9
Age				
17-24	3.2	2.8	3.0	2.7
25-49	4.8	5.3	5.0	5.4
50 and over	1.4	1.7	1.7	2.3
Highest Education Level Completed				
Less than High School	1.1	.8	.8	.8
High School	3.9	3.7	3.4	3.4
Some College	5.9	6.5	5.8	5.8
College Degree (or above)	10.7	11.1	9.1	10.2
Occupation				
Managerial, Professional	11.2	8.9	8.4	9.7
Other White Collar	2.6	4.1	3.2	3.6
Skilled Blue Collar[b]	4.2	4.6	4.3	4.1
Unskilled Blue Collar	.5	1.0	1.3	1.2
Industry				
Agri., Fish., Forest., Mining	1.8	2.1	3.3	3.0
Construction	1.5	2.5	2.2	1.7
Manufacturing	4.3	3.5	3.6	3.8
Transp., Comm., Util.	4.7	5.5	4.8	4.8
Fin., Insur., Real Estate	7.9	9.9	8.0	8.4
Services	2.7	3.5	4.3	5.6
Wholesale and Retail Trade	2.6	2.9	2.3	2.1
Region				
Northeast	3.6	3.6	3.3	3.7
North Central	4.5	4.3	3.9	4.2
South	2.7	3.1	3.5	4.0
West	3.7	4.6	4.5	4.2

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 42,800 for 1969; 39,325 for 1972; 36,914 for 1975; and 45,491 for 1978.

b. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table 2. Participation in Employer-Sponsored Job-Related Training, Taken At Work, Not by Correspondence, Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a]
(percentage of total population in category receiving this type of training)

Item	Year			
	1969	1972	1975	1978
Total	1.5	1.6	1.4	1.3
Sex				
Male	1.8	1.8	1.5	1.3
Female	.9	1.3	1.2	1.4
Race				
White	1.5	1.7	1.4	1.4
Nonwhite	.8	.7	1.0	.9
Age				
17-24	1.5	1.4	1.3	1.0
25-49	1.8	2.0	1.7	1.7
50 and over	.6	.8	.7	.8
Highest Education Level Completed				
Less than High School	.6	.4	.3	.3
High School	1.8	1.7	1.4	1.3
Some College	2.2	2.6	2.2	1.8
College Degree (or above)	3.1	3.9	2.9	2.9
Occupation				
Managerial, Professional	4.0	3.0	2.7	3.0
Other White Collar	1.2	1.8	1.2	1.1
Skilled Blue Collar[b]	1.9	2.0	1.7	1.5
Unskilled Blue Collar	.3	.7	.7	.5
Industry				
Agri., Fish., Forest., Mining	.4	.8	1.6	1.1
Construction	.2	.5	.5	.4
Manufacturing	2.0	1.7	1.4	1.4
Transp., Comm., Util.	2.3	3.2	2.3	1.7
Fin., Insur., Real Estate	2.5	3.7	2.9	2.5
Services	1.2	1.4	1.4	1.9
Wholesale and Retail Trade	.8	1.0	.8	.6
Region				
Northeast	1.5	1.5	1.3	1.2
North Central	1.7	1.6	1.2	1.4
South	1.2	1.4	1.4	1.3
West	1.4	2.1	1.8	1.5

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 42,677 for 1969; 39,217 for 1972; 36,827 for 1975; and 45,227 for 1978.

b. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

growth in staffing difficulties. Hence, the first rows in Tables 1 and 2 together imply that employers have turned more and more to training which is not taken at work to solve their human resources problems. The rest of the table implies that the groups whose training percentages rose most sharply in the past decade were getting most of this additional training outside of the work place.

In addition to the training percentages, separate estimates were made of annual hours per employee in employer-sponsored job-related training taken anywhere and taken at work. These estimates were calculated as the product of four variables for the appropriate cell: the relevant training participation rate; the number of relevant courses per employee who took training; the mean number of weeks per relevant course; and the mean number of hours of training per week trained in relevant courses.

The key questions for deriving the set of per employee figures were those pertaining to weeks per relevant course, and those pertaining to hours per week of training. Unfortunately, as will be seen, there are some severe comparability problems across surveys; however, as will also be discussed, these changes would not be expected to cause an understatement in the trend in ESJRT annual hours per employee.

Let us first consider the weeks per relevant course question. In 1969, 1972 and 1975, the question read:

8. How many weeks was this course scheduled to run?	Number of weeks (duration).....

in 1978, it was:

8b. How many WEEKS was this course or activity SCHEDULED to run from its beginning to end?	Number of weeks (duration)	(011) 1 ☐ No scheduled number of weeks (such as, private instruction continuing from year to year) 2 ☐ Less than one week (012) ____ Weeks

To effect as much consistency as possible between the 1978 and the earlier survey responses, we took two steps. First, we excluded correspondence courses from the 1969, 1972, and 1975 calculations, since these courses were the primary type which had "no scheduled number of weeks." Second, we excluded 1978 courses which were marked as "less than one week," on the ground that these courses would have elicited "0 weeks" responses in the 1969, 1972, and 1975 surveys; comparisons of the distributions of hours across surveys strongly supports this action.

In 1969, 1972 and 1975, the hours per course week question was:

7. How many HOURS A WEEK were you SCHEDULED to attend the course or take part in the activity?	Hours per week..... Note: If this is an "unscheduled" activity such as a correspondence course, enter average hours spent per week.	____

In 1978, the survey was altered to ask only about scheduled training hours:

8a. How many HOURS A WEEK were you SCHEDULED to attend this course or activity? ____	Number of hours per week	(010) x ☐ No scheduled number of hours (such as, a correspondence course) ____ Hours

Again, excluding correspondence courses from each year's hours tabulations most likely reduces any cross-survey differences in the treatment of courses with "no scheduled number of hours."

Table 3 presents the SAE figures concerning annual hours per employee of ESJRT taken anywhere.[11] The first row indicates that there was not an increase in the investment in formal training per employee over the past decade, despite the apparent reduction (controlling for cyclical effects) in employers' ability to attract and retain employees.

There are, however, some industries and regions which depart from the no-change norm. In particular, in the very rapidly growing service sector, annual hours per employee of ESJRT rose dramatically from 5.2 in 1972 to 8.5 in 1978.[12] Also worthy of note is that in the Northeastern economy, which has suffered greatly of late, annual hours per employee fell from 8.0 in 1972 to 6.0 in 1978.[13] While there were other increases and decreases in per employee formal training, which appear to depend primarily on economic growth and technological change, they offset each other, resulting in constant formal training per employee.

Table 4 gives estimates of annual per employee hours of ESJRT taken at work.[14] The total now indicates that there was a sharp decline in the amount of in-house formal training given employees during the past decade. If we choose two roughly comparable years, we find that our in-house formal training variable fell from 3.1 hours per employee per year in 1972 to 1.4 hours per employee per year in 1978.[15] Moreover, there appears to be a reduction in the formal ESJRT received at work by employees in each of the table's categories.

Statistical Artifact?

As we have seen, despite the apparent growing difficulty of securing the desired work force at a given point in the business cycle, there does not

Table 3. Annual Hours per Employee in Employer-Sponsored Job-Related Training, Taken Anywhere, Not by Correspondence, Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a,b]

Item	Year[c]			
	1969	1972	1975	1978
Total	7.5	7.5	6.4	6.5
Sex				
Male	10.2	9.9	7.8	7.4
Female	2.9	3.6	4.0	5.1
Race				
White	8.0	8.0	6.5	6.9
Nonwhite	3.3	2.9	5.0	3.4
Age				
17-24	8.5	7.4	5.5	4.4
25-49	10.0	9.9	8.6	8.8
50 and over	1.7	2.5	2.1	2.8
Highest Education Level Completed				
Less than High School	2.1	1.7	0.8	1.0
High School	8.5	6.9	5.5	4.8
Some College	12.1	13.2	10.2	9.8
College Degree (or above)	21.3	21.8	16.7	18.5
Occupation				
Managerial, Professional	21.3	17.2	13.9	16.4
Other White Collar	5.2	6.4	4.4	4.8
Skilled Blue Collar[d]	11.0	11.0	10.8	7.8
Unskilled Blue Collar	1.5	2.5	1.8	1.7
Industry				
Agri., Fish., Forest., Mining	4.2	3.6	4.7	4.4
Construction	2.1	5.5	4.1	2.2
Manufacturing	8.4	6.9	6.7	6.0
Transp., Comm., Util.	8.7	12.1	8.8	9.5
Fin., Insur., Real Estate	14.0	16.5	12.4	12.9
Services	5.8	5.2	6.9	8.5
Wholesale and Retail Trade	4.7	5.1	2.6	2.9
Region				
Northeast	7.9	8.0	6.3	6.0
North Central	9.3	7.8	6.5	6.4
South	5.7	6.7	5.8	7.0
West	6.6	7.2	6.7	6.1

Footnotes to Table 3

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample sizes for Table 1 were 42,800 for 1969; 39,325 for 1972; 36,914 for 1975; and 45,491 for 1978.

b. Each figure was calculated as the product of four variables for the appropriate cell: the relevant training participation rate; the number of relevant courses per employee who took training; the mean number of weeks per relevant course; and the mean number of hours of training per week trained in relevant courses.

c. In the interest of maintaining consistency in hours and weekly hours of training over the surveys, several adjustments were made. The minimum value used for both weeks and hours was 1. Since maxima varied from year to year, valid values for hours over 39 were set to 43, while valid values for weeks over 52 were set to 52. Given that courses without scheduled hours or weeks (especially correspondence courses) were handled differently in different years, correspondence courses and those indicated to have unscheduled hours or weeks were excluded from the calculations.

d. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table 4. Annual Hours per Employee in Employer-Sponsored Job-Related Training, Taken At Work, Not by Correspondence, Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a,b]

Item	Year[c]			
	1969	1972	1975	1978
Total	2.8	3.1	2.4	1.4
Sex				
Male	3.6	3.8	2.8	1.3
Female	1.5	1.9	1.7	1.4
Race				
White	2.8	3.3	2.3	1.4
Nonwhite	2.6	1.4	2.8	1.5
Age				
17-24	4.3	4.7	2.8	1.3
25-49	3.3	3.5	2.8	1.7
50 and over	0.6	1.1	0.8	.7
Highest Education Level Completed				
Less than High School	1.2	0.8	0.4	.2
High School	3.9	3.4	2.5	1.4
Some College	3.2	4.9	3.0	1.9
College Degree (or above)	4.9	7.3	5.1	2.9
Occupation				
Managerial, Professional	6.2	5.5	4.0	3.1
Other White Collar	2.3	3.0	1.6	1.3
Skilled Blue Collar[d]	5.1	4.5	5.1	1.5
Unskilled Blue Collar	0.7	1.6	1.0	.5
Industry				
Agri., Fish., Forest., Mining	0.2	1.4	1.7	1.1
Construction	0.4	1.0	1.2	.2
Manufacturing	3.4	3.4	2.5	1.3
Transp., Comm., Util.	2.6	5.6	3.5	2.4
Fin., Insur., Real Estate	4.4	5.6	5.3	3.4
Services	2.8	1.9	2.6	1.8
Wholesale and Retail Trade	1.6	2.0	0.9	.6
Region				
Northeast	3.2	3.2	2.3	1.2
North Central	3.7	3.2	2.4	1.4
South	1.9	3.1	2.5	1.4
West	2.1	3.0	2.2	1.6

Footnotes to Table 4

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample sizes for Table 2 were 42,677 for 1969; 39,217 for 1972; 36,827 for 1975; and 45,227 for 1978.

b. Each figure was calculated as the product of four variables for the appropriate cell: the relevant training participation rate; the number of relevant courses per employee who took training; the mean number of weeks per relevant course; and the mean number of hours of training per week trained in relevant courses.

c. In the interest of maintaining consistency in hours and weekly hours of training over the surveys, several adjustments were made. The minimum value used for both weeks and hours was 1. Since maxima varied from year to year, valid values for hours over 39 were set to 43, while valid values for weeks over 52 were set to 52. Given that courses without scheduled hours or weeks (especially correspondence courses) were handled differently in different years, correspondence courses and those indicated to have unscheduled hours or weeks were excluded from the calculations.

d. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

appear to have been an increase in the annual hours of formal training given on a per employee basis. Is this result fact, or simply a fiction produced by the changing SAE survey?

Perhaps the main reason to question the SAE hours per employee results (but not the SAE participation percentages) is that due to changes in the questionnaire's wording, a much larger percentage of courses were ignored in the annual hours per employee analysis in 1975 than in 1969 and 1972, and a still larger percentage were excluded in 1978. To assess the impact of these exclusions on the hours per employee estimates, a two-step procedure was adopted. First, the following regression was fit, using all cells but those in the Total row in Table 3 as the unit of observation:

(1) $DHPE = \alpha + \beta_1 DPWW + \beta_2 DPWH,$

where DHPE equals hours per employee of ESJRT in 1978 minus the same variable in 1969;

DPWW equals the percentage of courses in 1978 with information on weeks per course minus the same variable in 1969; and

DPWH equals the percentage of courses in 1978 with information on hours per training week minus the same variable in 1969.

Second, the values of DPWW and DPWH for the "Total" row were used in conjunction with the cross-sectional estimates of β_1 and β_2 to gauge the likely impact of the questionnaire changes on the observed trend in annual hours of ESJRT per employee taken anywhere. This analysis indicates that the observed DHPE figure (1978 value minus 1969 value) for training taken anywhere is likely to be overstated by 1.6 hours. Repeating the same analysis for Table 4 indicates that the observed DHPE figure for at work training is likely

to be understated by only .6 hours. (If we replicate the analysis of DHPE for the period 1972 to 1978, we find that changes in the SAE questionnaire are likely to produce overstatements in both the total and in-house DHPE estimates.) Hence, while the SAE questionnaire changes under analysis may have biased DHPE, the existing evidence suggests that any bias which exists could not possibly explain our basic findings. However, it is still the case that other changes in the SAE, which led to the inclusion of different courses in the training calculations, might have affected the per employee ESJRT figures. Nevertheless, our investigations have indicated that these possibilities are remote. Finally, it should be remembered that the participation rates given in Table 2, which were derived from a virtually unchanging battery of questions, also do not imply a sharp increase in formal training in response to the apparent sharp decline in employers' ability to get the work forces they desire at a given point in the business cycle.

One possible reason for the apparent weakness of the ESJRT response concerns differences between the various surveys' treatment of apprentices. Specifically, while in 1969, 1972 and 1975, courses taken as part of apprenticeships were only implicitly excluded, in 1978 the questionnaire explicitly instructed the respondent not to report any "apprenticeship or internship program," as discussed above. Our analysis of possible impacts of the presence of apprenticeships on our 1969 to 1975 training figures, however, demonstrates that apprenticeship is extremely insignificant to the survey results. In every case, apprenticeships represented less than one-half of one percent of the total SAE sample. Thus, it is not likely that the stricter inclusion standards in the 1978 SAE had much effect on our ESJRT trend.

Factors which might affect the expected costs of and returns to investments in ESJRT can easily be identified. They include variables which determine the present value of the returns to ESJRT (e.g., the productivity effects of successful training, the probability of the employee remaining with the present firm, and the length of the employee's work life) and factors conditioning the present value of the costs of this type of training (e.g., the values of the trainee's and trainer's time; the costs of classroom space and training materials; the tax treatment of training versus other investments; and the general or firm-specific nature of the training). However, at this point in time, evidence concerning the nature and form of the ESJRT investment function does not exist. When this information becomes available, the trend in the importance of employer-sponsored job-related training should become much better understood.

Some Concluding Queries

One might wonder if there is any evidence that employers chose the alternatives to increased ESJRT. If not, one might question whether the apparent increase in unsatisfied labor demand, netting out the cycle, is a reality.

There is strong evidence that employers confronted with an inability to meet their labor demands have in fact turned to wage bidding to attract the employees they want but do not have. For the country as a whole, it appears that a sizeable fraction of the marked increase in the 1970's of the degree of wage growth associated with a given unemployment rate (either the official rate or the prime-age male rate) can be explained by growth in labor market imbalance.[16]

Moreover, preliminary analysis of regional rates of wage growth supports this claim. As for total factor productivity, it appears that much of the recent dwindling in national rates and much of the cross-regional pattern of rates can be explained by labor market imbalance.[17]

One might also wonder whether EJRT really increases the productivity of workers. The evidence accumulated so far indicates that at least in the manufacturing sector, it does. This conclusion is based on both publicly-available data for all employees in twenty manufacturing industries, and on computerized personnel data for managers and professionals provided by two large manufacturing companies.[18]

Finally, one might wonder whether employers have been irrational in not investing more in formal training. The response here seems to be that there is no reason to believe that employers' decisions concerning formal training were not guided by profit maximization. For a given employer, pirating needed employees or accepting worse workers than had been used in the past might be better from a private point of view than training. However, from a social point of view, which brings inflationary pressure and productivity growth into the calculus, the same decision may not be optimal. Good private decision making can lead to undesirable social outcomes. When this is the case, society must ask whether the government should intervene and condition market outcomes. This question should be asked about employer-sponsored job-related training.

Footnotes

1. A correction of this sort was first proposed by George L. Perry in "Changing Labor Markets and Inflation," Brookings Papers on Economic Activity 3:1970, pp. 411-41 .

2. Particularly after the 1973 AT&T consent decree, affirmative action pressures may have encouraged some employers to advertise job vacancies which in reality had already been filled. Other changes in the advertising market, such as reduced prices of newspaper advertising relative to other advertising, would also bias the help wanted index. For a more detailed discussion, see Katharine G. Abraham, Vacancies, Unemployment, and Wage Growth (Ph.D. thesis, Harvard University, 1982), pp. 81-3.

3. The definition of discharges is from the Department of Labor, Bureau of Labor Statistics, Handbook of Methods, Bulletin 1910 (Washington, D.C., 1976), p. 44.

4. The 71 periodicals were those listed in the Index to Business Periodicals in both 1958 and 1981, implying continuing publication over the period. For a discussion of the content of the literature surveyed, see James L. Medoff and Jonathan B. Wiener, "Labor Markets in Imbalance: Review of Qualitative Evidence," mimeographed, October 1982.

5. Separate tables for males and females may be found in Appendix A. The standard errors for the figures in the "Total" row are: in 1969, .089; in 1972, .090; in 1975, .099; and in 1978, .093.

6. An "SAE year" runs from May of the year preceding the survey to April of the survey year; thus, "SAE year" 1969 covers the 12-month period from May

1968 through April 1969.

7. The standard error of the difference is .134.

8. The three groups mentioned (women, employees in services, and employees in the South) were the groups in the table with the fastest growth in employment over the 1970s; the following figures are instructive:

Group	% Change in Employment, 1970-1980*
All employees	28
Women	47
Men	17
Service-producing	38
Goods-producing	9
South	47 (1969-1979)
Non-South	23 (1969-1979)

*Sources: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, Vol. 18, No. 9 (March 1972); Vol. 28, No. 3 (March 1981); Volume 29, No. 3 (March 1982); and BLS Handbook of Labor Statistics, Bulletin 2070 (December 1980), Table 79. The data on South and non-South exclude Michigan, where directly comparable data on employment were not available until 1978.

9. The Age Discrimination in Employment Act of 1967 was amended in 1978 to raise the non-government, non-teaching, non-executive, non-high policy-making mandatory retirement age from 65 to 70, and to eliminate mandatory retirement for all non-foreign service government workers. The hearings on these amendments were held for several years before their passage and thus employers might have increased training of older workers in order to take advantage of the coming age change.

10. Separate tables for males and females may be found in Appendix A. The standard errors for the "Total" row are: in 1969, .058; in 1972, .067; in 1975, .061; and in 1978, .054.

11. Separate tables for males and females may be found in Appendix A. The standard errors for the "Total" row are: in 1969, .280; in 1972, .422; in

1975, .370; and in 1978, .341.

12. The standard error of the difference is 1.085.

13. The standard error of the difference is 1.641.

14. Separate tables for males and females may be found in Appendix A. The standard errors for the "Total" row are: in 1969, .233; in 1972, .274; in 1975, .169; and in 1978, .126.

15. The standard error of the difference is .300.

16. The Phillips curve estimations are performed in J.L. Medoff and K.G. Abraham, "Unemployment, Unsatisfied Demand for Labor, and Compensation Growth, 1956-1980," in Martin N. Baily, eds., Workers, Jobs, and Inflation (Washington, D.C.: Brookings, 1982), pp. 49-88.

17. The national wage growth results are presented in J.L. Medoff and K.G. Abraham, "Unemployment, Unsatisfied Demand for Labor, and Compensation Growth, 1956-1980." The results on regional wage growth are based on research in progress by the author and Linda Bell. The imbalance/national productivity growth relationships are presented in J.L. Medoff, "Formal Training and Labor Productivity," mimeographed, October 1982, and J.L. Medoff, "Labor Markets in Imbalance," in process. Regional productivity growth rates for manufacturing are presented in Charles R. Hulten and Robert M. Schwab, "Regional Productivity Growth in U.S. Manufacturing: 1951-1978," mimeographed, July 1982.

18. See J.L. Medoff, "Formal Training and Labor Productivity," mimeographed, October 1982.

APPENDIX A

Table A1. Participation in Employer-Sponsored Job-Related Training, Taken Anywhere, Not by Correspondence, Male Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a]
(percentage of total population in category receiving this type of training)

Item	Year			
	1969	1972	1975	1978
Total	4.6	4.5	4.2	4.2
Race				
White	5.0	4.8	4.3	4.4
Nonwhite	1.4	1.6	2.3	1.9
Age				
17-24	4.3	2.9	3.1	2.5
25-49	6.2	6.4	5.5	5.7
50 and over	1.5	1.7	1.9	2.1
Highest Education Level Completed				
Less than High School	1.3	1.0	.9	.8
High School	5.2	4.2	3.9	3.5
Some College	7.6	7.3	5.9	5.5
College Degree (or above)	12.0	12.3	9.2	10.1
Occupation				
Managerial, Professional	10.8	9.4	7.9	8.6
Other White Collar	7.3	6.7	4.8	5.0
Skilled Blue Collar[b]	4.0	4.6	4.4	4.2
Unskilled Blue Collar	.5	1.0	1.2	1.0
Industry				
Agri., Fish., Forest., Mining	2.1	2.1	3.5	3.3
Construction	1.6	2.5	2.1	1.6
Manufacturing	5.5	4.3	4.4	4.5
Transp., Comm., Util.	5.2	5.6	4.5	4.6
Fin., Insur., Real Estate	11.2	13.9	9.2	9.3
Services	3.6	3.9	4.0	5.2
Wholesale and Retail Trade	3.7	4.1	3.4	3.1
Region				
Northeast	4.6	4.4	3.7	4.0
North Central	5.8	5.0	4.3	4.5
South	3.6	3.7	4.1	4.1
West	4.4	5.3	4.6	4.0

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 26,755 for 1969; 24,287 for 1972; 22,289 for 1975; and 26,819 for 1978.

b. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table A2. Participation in Employer-Sponsored Job-Related Training, Taken Anywhere, Not by Correspondence, Female Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a]
(percentage of total population in category receiving this type of training)

Item	Year			
	1969	1972	1975	1978
Total	1.9	2.6	3.1	3.8
Race				
White	2.0	2.8	3.2	4.1
Nonwhite	1.1	1.3	2.0	2.0
Age				
17-24	1.8	2.6	2.8	2.8
25-49	2.2	3.2	4.0	4.9
50 and over	1.2	1.7	1.5	2.5
Highest Education Level Completed				
Less than High School	.8	.6	.6	.7
High School	2.1	2.9	2.7	3.3
Some College	3.0	5.0	5.5	6.3
College Degree (or above)	5.2	6.8	8.9	10.6
Occupation				
Managerial, Professional	12.9	7.4	9.9	12.2
Other White Collar	.2	2.9	2.4	3.0
Skilled Blue Collar[b]	8.7	3.2	2.1	2.4
Unskilled Blue Collar	.6	1.1	1.4	1.5
Industry				
Agri., Fish., Forest., Mining	0.0	1.8	2.7	1.9
Construction	.9	1.9	3.0	3.0
Manufacturing	1.2	1.6	1.6	2.3
Transp., Comm., Util.	3.1	5.1	5.5	5.6
Fin., Insur., Real Estate	4.9	6.4	6.9	7.8
Services	2.2	3.3	4.5	5.9
Wholesale and Retail Trade	1.0	1.2	.9	.9
Region				
Northeast	1.9	2.3	2.7	3.3
North Central	2.1	3.0	3.2	3.8
South	1.3	2.2	2.6	3.9
West	2.4	3.5	4.3	4.5

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 16,045 for 1969; 15,038 for 1972; 14,625 for 1975; and 18,672 for 1978.

b. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table A3. Participation in Employer-Sponsored Job-Related Training, Taken At Work, Not by Correspondence, Male Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a]
(percentage of total population in category receiving this type of training)

Item	Year			
	1969	1972	1975	1978
Total	1.8	1.8	1.5	1.3
Race				
White	1.9	1.9	1.6	1.3
Nonwhite	1.0	.8	1.0	.8
Age				
17-24	2.0	1.5	1.3	.8
25-49	2.2	2.4	2.0	1.7
50 and over	.7	.8	.7	.7
Highest Education Level Completed				
Less than High School	.7	.5	.3	.3
High School	2.3	1.8	1.7	1.4
Some College	2.5	2.8	2.0	1.4
College Degree (or above)	3.6	4.2	3.1	2.5
Occupation				
Managerial, Professional	3.5	2.9	2.5	2.3
Other White Collar	3.3	3.0	2.0	1.4
Skilled Blue Collar[b]	1.8	2.1	1.7	1.5
Unskilled Blue Collar	.3	.6	.6	.4
Industry				
Agri., Fish., Forest., Mining	.4	.8	1.7	1.2
Construction	.2	.5	.5	.4
Manufacturing	2.4	2.0	1.8	1.7
Transp., Comm., Util.	2.3	2.0	2.3	1.6
Fin., Insur., Real Estate	3.4	4.9	3.4	2.1
Services	1.3	1.1	.9	1.2
Wholesale and Retail Trade	1.1	1.2	1.1	.7
Region				
Northeast	1.9	1.7	1.4	1.1
North Central	2.0	1.7	1.4	1.2
South	1.5	1.5	1.7	1.4
West	1.6	2.5	1.8	1.3

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 26,684 for 1969; 24,214 for 1972; 22,235 for 1975; and 26,668 for 1978.

b. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table A4. Participation in Employer-Sponsored Job-Related Training, Taken At Work, Not by Correspondence, Female Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a]
(percentage of total population in category receiving this type of training)

Item	Year			
	1969	1972	1975	1978
Total	.9	1.3	1.2	1.4
Race				
White	1.0	1.4	1.2	1.5
Nonwhite	.6	.6	.9	1.0
Age				
17-24	.8	1.3	1.2	1.2
25-49	1.2	1.5	1.3	1.7
50 and over	.5	1.0	.7	.9
Highest Education Level Completed				
Less than High School	.5	.3	.4	.2
High School	1.1	1.6	1.0	1.2
Some College	1.4	2.3	2.5	2.3
College Degree (or above)	1.4	2.6	2.2	3.9
Occupation				
Managerial, Professional	5.7	3.3	3.3	4.5
Other White Collar	.1	1.3	.8	.9
Skilled Blue Collar[b]	6.4	1.6	1.3	1.2
Unskilled Blue Collar	.4	.7	.8	.7
Industry				
Agri., Fish., Forest., Mining	0.0	0.0	1.1	0.0
Construction	0.0	0.0	0.0	0.0
Manufacturing	.7	.8	.4	.6
Transp., Comm., Util.	2.2	3.8	2.6	2.0
Fin., Insur., Real Estate	1.7	2.6	2.4	2.8
Services	1.2	1.6	1.7	2.4
Wholesale and Retail Trade	.4	.6	.4	.3
Region				
Northeast	.9	1.2	1.1	1.3
North Central	1.1	1.3	1.0	1.3
South	.7	1.3	1.0	1.3
West	1.1	1.5	1.7	1.2

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 15,993 for 1969; 15,003 for 1972; 14,592 for 1975; and 18,559 for 1978.

b. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table A5 . Annual Hours per Employee in Employer-Sponsored Job-Related Training, Taken Anywhere, Not by Correspondence, Male Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a,b]

Item	Year[c]			
	1969	1972	1975	1978
Total	10.2	9.9	7.8	7.4
Race				
White	10.9	10.5	8.0	7.9
Nonwhite	4.5	3.7	6.1	2.9
Age				
17-24	12.7	9.6	7.2	4.9
25-49	13.4	13.3	10.7	10.1
50 and over	1.7	2.6	2.0	2.7
Highest Education Level Completed				
Less than High School	2.5	1.9	.9	1.0
High School	12.2	9.4	7.5	5.7
Some College	17.4	17.6	12.0	10.0
College Degree (or above)	24.6	25.0	17.4	15.0
Occupation				
Managerial, Professional	21.4	19.1	13.8	15.8
Other White Collar	15.0	13.1	7.7	6.8
Skilled Blue Collar[d]	11.2	11.1	11.1	8.1
Unskilled Blue Collar	1.8	2.9	1.9	1.6
Industry				
Agri., Fish., Forest., Mining	4.9	4.2	4.6	4.9
Construction	2.2	5.7	4.3	2.3
Manufacturing	11.1	9.7	8.6	7.2
Transp., Comm., Util.	9.4	12.6	8.9	9.2
Fin., Insur., Real Estate	22.7	26.9	18.4	15.4
Services	9.3	7.2	8.1	10.3
Wholesale and Retail Trade	7.1	8.2	3.7	4.4
Region				
Northeast	10.5	11.0	7.9	7.5
North Central	12.5	10.0	7.8	7.6
South	8.6	8.7	7.6	7.3
West	8.1	9.7	7.9	6.1

Footnotes, Table A5

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 26,755 for 1969; 24,287 for 1972; 22,289 for 1975; and 26,819 for 1978.

b. Each figure was calculated as the product of four variables for the appropriate cell: the relevant training participation rate; the number of relevant courses per employee who took training; the mean number of weeks per relevant course; and the mean number of hours of training per week trained in relevant courses.

c. In the interest of maintaining consistency in hours and weekly hours of training over the surveys, several adjustments were made. The minimum value used for both weeks and hours was 1. Since maxima varied from year to year, valid values for hours over 39 were set to 43, while valid values for weeks over 52 were set to 52. Given that courses without scheduled hours or weeks (especially correspondence courses) were handled differently in different years, correspondence courses and those indicated to have unscheduled hours or weeks were excluded from the calculations.

d. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table A6. Annual Hours per Employee in Employer-Sponsored Job-Related Training, Taken Anywhere, Not by Correspondence, Female Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a,b]

Item	Year[c]			
	1969	1972	1975	1978
Total	2.9	3.6	4.0	5.1
Race				
White	3.0	3.8	4.1	5.3
Nonwhite	1.9	1.9	3.7	3.8
Age				
17-24	3.2	4.8	3.6	3.9
25-49	3.4	3.8	5.2	6.7
50 and over	1.6	2.0	2.1	2.6
Highest Education Level Completed				
Less than High School	1.2	1.2	.8	.8
High School	3.8	3.9	3.1	3.6
Some College	2.8	5.8	7.5	9.2
College Degree (or above)	7.5	9.7	13.5	16.7
Occupation				
Managerial, Professional	20.7	11.1	14.5	17.7
Other White Collar	.2	3.2	2.4	3.7
Skilled Blue Collar[d]	7.1	6.3	3.6	1.7
Unskilled Blue Collar	1.0	1.9	1.8	1.8
Industry				
Agri., Fish., Forest., Mining	0.0	.9	4.7	1.5
Construction	.8	2.9	1.2	1.5
Manufacturing	1.4	2.5	2.0	3.0
Transp., Comm., Util.	5.4	9.3	8.7	9.9
Fin., Insur., Real Estate	6.3	7.3	7.5	10.8
Services	3.7	3.8	6.0	7.6
Wholesale and Retail Trade	1.4	1.1	.9	.9
Region				
Northeast	3.6	3.2	3.7	3.5
North Central	3.5	3.9	4.4	4.6
South	1.1	3.6	3.2	6.1
West	4.0	3.2	5.0	6.0

Footnotes, Table A6

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 16,045 for 1969; 15,038 for 1972; 14,625 for 1975; and 18,672 for 1978.

b. Each figure was calculated as the product of four variables for the appropriate cell: the relevant training participation rate; the number of relevant courses per employee who took training; the mean number of weeks per relevant course; and the mean number of hours of training per week trained in relevant courses.

c. In the interest of maintaining consistency in hours and weekly hours of training over the surveys, several adjustments were made. The minimum value used for both weeks and hours was 1. Since maxima varied from year to year, valid values for hours over 39 were set to 43, while valid values for weeks over 52 were set to 52. Given that courses without scheduled hours or weeks (especially correspondence courses) were handled differently in different years, correspondence courses and those indicated to have unscheduled hours or weeks were excluded from the calculations.

d. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table A7. Annual Hours per Employee in Employer-Sponsored Job-Related Training, Taken At Work, Not by Correspondence, Female Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a,b]

Item	Year[c]			
	1969	1972	1975	1978
Total	1.5	1.9	1.7	1.4
Race				
White	1.5	2.1	1.6	1.4
Nonwhite	.8	.8	2.2	2.2
Age				
17-24	1.6	3.2	1.7	1.5
25-49	1.9	1.5	1.8	1.7
50 and over	.5	1.3	.8	.6
Highest Education Level Completed				
Less than High School	.9	1.0	.8	.2
High School	2.0	2.2	1.3	1.1
Some College	1.3	2.5	2.7	2.4
College Degree (or above)	1.4	4.7	5.1	4.6
Occupation				
Managerial, Professional	9.7	4.8	5.6	4.1
Other White Collar	0.0	1.4	.8	1.1
Skilled Blue Collar[d]	5.5	5.8	2.8	.7
Unskilled Blue Collar	.8	1.6	1.3	.7
Industry				
Agri., Fish., Forest., Mining	0.0	.1	.8	.2
Construction	0.0	.7	0.0	0.0
Manufacturing	.8	1.1	.4	.8
Transp., Comm., Util.	2.9	6.3	3.1	2.3
Fin., Insur., Real Estate	1.7	3.1	2.7	3.9
Services	2.3	1.9	2.9	1.9
Wholesale and Retail Trade	.4	.4	.4	.2
Region				
Northeast	1.5	1.7	1.7	1.0
North Central	2.1	2.0	2.2	1.8
South	.5	2.4	1.3	1.0
West	2.4	1.3	1.7	2.1

Footnotes, Table A7

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 15,993 for 1969; 15,003 for 1972; 14,592 for 1975; and 18,559 for 1978.

b. Each figure was calculated as the product of four variables for the appropriate cell: the relevant training participation rate; the number of relevant courses per employee who took training; the mean number of weeks per relevant course; and the mean number of hours of training per week trained in relevant courses.

c. In the interest of maintaining consistency in hours and weekly hours of training over the surveys, several adjustments were made. The minimum value used for both weeks and hours was 1. Since maxima varied from year to year, valid values for hours over 39 were set to 43, while valid values for weeks over 52 were set to 52. Given that courses without scheduled hours or weeks (especially correspondence courses) were handled differently in different years, correspondence courses and those indicated to have unscheduled hours or weeks were excluded from the calculations.

d. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.

Table A8. Annual Hours per Employee in Employer-Sponsored Job-Related Training, Taken At Work, Not by Correspondence, Male Workers 17 or over by Selected Population Characteristics, Occupation, Industry, and Region[a,b]

Item	Year[c]			
	1969	1972	1975	1978
Total	3.6	3.8	2.8	1.3
Race				
White	3.6	4.0	2.7	1.4
Nonwhite	3.9	1.8	3.1	.8
Age				
17-24	6.8	6.0	3.7	1.1
25-49	4.0	4.6	3.4	1.7
50 and over	.6	.9	.7	.8
Highest Education Level Completed				
Less than High School	1.3	.8	.2	.3
High School	5.4	4.4	3.6	1.7
Some College	4.3	6.4	3.2	1.5
College Degree (or above)	5.6	8.0	5.2	2.3
Occupation				
Managerial, Professional	5.2	5.7	3.5	2.6
Other White Collar	7.0	6.4	3.3	1.5
Skilled Blue Collar[d]	5.1	4.4	5.2	1.5
Unskilled Blue Collar	.7	1.6	.8	.4
Industry				
Agri., Fish., Forest., Mining	.2	1.6	1.8	1.2
Construction	.4	.9	1.2	.2
Manufacturing	4.5	4.2	3.4	1.5
Transp., Comm., Util.	2.5	5.2	3.4	2.4
Fin., Insur., Real Estate	7.7	8.6	8.8	2.7
Services	3.4	1.8	2.0	1.9
Wholesale and Retail Trade	2.5	3.4	1.2	.9
Region				
Northeast	4.1	4.2	2.6	1.2
North Central	4.6	3.8	2.5	1.2
South	2.9	3.5	3.2	1.5
West	2.0	3.9	2.4	1.3

Footnotes, Table A8

a. These figures were calculated from the Survey of Adult Education (a supplement to the May Current Population Survey) for 1969, 1972, 1975 and 1978; they were derived using CPS sampling weights. They were derived for employed private wage and salaried workers who, if they are under 35 years of age, are not full-time students in a regular school at the time of the survey. The sample size was 26,684 for 1969; 24,214 for 1972; 22,235 for 1975; and 26,668 for 1978.

b. Each figure was calculated as the product of four variables for the appropriate cell: the relevant training participation rate; the number of relevant courses per employee who took training; the mean number of weeks per relevant course; and the mean number of hours of training per week trained in relevant courses.

c. In the interest of maintaining consistency in hours and weekly hours of training over the surveys, several adjustments were made. The minimum value used for both weeks and hours was 1. Since maxima varied from year to year, valid values for hours over 39 were set to 43, while valid values for weeks over 52 were set to 52. Given that courses without scheduled hours or weeks (especially correspondence courses) were handled differently in different years, correspondence courses and those indicated to have unscheduled hours or weeks were excluded from the calculations.

d. Skilled workers include craftsmen and foremen. Unskilled workers include operatives, laborers, farm laborers, private household workers and service workers.